

CLAIMS

What is claimed is:

1. A method for sending a plurality of ordered sets of data, the method comprising:
 - 5 identifying a barrier phase transition;
resetting a current data set indicator for the plurality of ordered sets of data to a predetermined ordered set of the plurality of ordered sets of data in response to receiving the barrier phase transition;
10 sending an ordered set of data of the plurality of ordered sets of data indicated by the current data set indicator; and
advancing the current data set indicator to a next ordered set of data of the plurality of ordered sets of data.
 2. The method of claim 1, further comprising inverting a barrier bit in response to identifying the barrier phase transition.
 - 15 3. The method of claim 1, further comprising sending a start bit indication when the current data set indicator indicates the predetermined ordered set of the plurality of ordered sets of data.
 4. The method of claim 1, wherein the plurality of ordered sets of data include flow control information.
 - 20 5. The method of claim 1, wherein sending the ordered set of data of the plurality of ordered sets of data indicated by the current data set indicator includes adding the ordered set of data to a field of a packet.
 6. The method of claim 1, wherein identifying the barrier phase transition includes maintaining a current barrier state, and receiving a new barrier state indication different
25 than the current barrier state.

7. A packet switching system performing the method of claim 1.

8. A packet switching element performing the method of claim 1.

9. A computer-readable medium containing computer-executable instructions for
5 performing the method of claim 1.

10. A method for updating a data structure, the method comprising:

receiving a barrier bit;

receiving a start bit;

10 resetting a current data structure address to a predetermined address within the
data structure in response to receiving the barrier bit and receiving the start bit;

receiving a plurality of data units;

updating the current data structure based on the received plurality of data units;

and

15 advancing the current data structure address to a next location for storing a data
unit.

11. The method of claim 10, wherein identifying the barrier phase transition
includes maintaining a current barrier state, and receiving a new barrier state indication
different than the current barrier state.

12. The method of claim 10, further comprising maintaining a current barrier bit
20 state and comparing the current barrier bit state with a value of the received barrier bit.

13. The method of claim 10, wherein the plurality of data units include flow
control information.

14. A packet switching system performing the method of claim 10.

15. A packet switching element performing the method of claim 10.

16. An apparatus for sending a plurality of ordered sets of data, the apparatus comprising:

means for identifying a barrier phase transition;

5 means for resetting a current data set indicator for the plurality of ordered sets of data to a predetermined ordered set of the plurality of ordered sets of data in response to receiving the barrier phase transition;

means for sending an ordered set of data of the plurality of ordered sets of data indicated by the current data set indicator; and

10 means for advancing the current data set indicator to a next ordered set of data of the plurality of ordered sets of data.

17. The apparatus of claim 16, comprising means for inverting a barrier bit in response to identifying the barrier phase transition.

15 18. The apparatus of claim 16, comprising means for sending a start bit indication when the current data set indicator indicates the predetermined ordered set of the plurality of ordered sets of data.

19. The apparatus of claim 16, wherein the plurality of ordered sets of data include flow control information.

20 20. The apparatus of claim 16, comprising means for adding the ordered set of data to a field of a packet.

21. The apparatus of claim 16, comprising means for maintaining a current barrier state, and means for receiving a new barrier state indication different than the current barrier state.

22. An apparatus for updating a data structure, the apparatus comprising:
- means for receiving a barrier bit;
 - means for receiving a start bit;
 - means for resetting a current data structure address to a predetermined address
- 5 within the data structure in response to receiving the barrier bit and receiving the start bit;
- means for receiving a plurality of data units;
 - means for updating the current data structure based on the received plurality of
- data units; and
- means for advancing the current data structure address to a next location for
- 10 storing a data unit.

23. The apparatus of claim 22, comprising means for maintaining a current barrier state, and means for receiving a new barrier state indication different than the current barrier state.

24. The apparatus of claim 22, comprising means for maintaining a current barrier
- 15 bit state and means for comparing the current barrier bit state with a value of the received barrier bit.

25. The apparatus of claim 22, wherein the plurality of data units include flow control information.

26. A packet switching system comprising:

a plurality of first elements;

a plurality of second elements;

wherein each of the plurality of first elements includes:

5 a memory configured to store a first data structure;

a first barrier state maintainer to indicate a current first barrier state;

a first barrier accumulator to receive indications of a first subset of a plurality of barrier request messages, to determine when a first barrier request may be sent to the plurality of second elements, and to update the current first barrier state; and

10 a first data forwarder for sending information maintained in the first data structure to the plurality of second elements.

27. The packet switching system of claim 26, wherein each of the plurality of second elements includes:

a second memory configured to store a second data structure;

15 a second barrier state maintainer to indicate a current second barrier state;

a second barrier accumulator to receive indications of a second subset of a plurality of barrier request messages, to determine when a second barrier request may be sent to a plurality of third elements, and to update the current second barrier state; and

20 a second data forwarder for sending information maintained in the second data structure in a predetermined order to the plurality of third elements,

wherein the predetermined order is reset in response to identifying a barrier state transition.

28. The packet switching system of claim 27, wherein each of the plurality of third elements includes:

- a third memory configured to store a third data structure;
- a third barrier state maintainer to indicate a current third barrier state;
- 5 a third barrier accumulator to receive indications of a third subset of a plurality of barrier request messages, to determine when a third barrier request may be sent, and to update the current third barrier state.

29. The packet switching system of claim 26, wherein each of the plurality of second elements includes a second data forwarder for sending said first data structure
10 information received from the plurality of first elements to a plurality of third elements.

30. The packet switching system of claim 26, wherein each of the plurality of first elements is a switching element.

31. The packet switching system of claim 30, wherein each of the plurality of first elements is a switching element.

15 32. The packet switching system of claim 31, wherein each of the plurality of first elements is a switching element.